ENERGY

SACRAMENTO COUNTY GENERAL PLAN

ENERGY ELEMENT

POLICY PLAN

Prepared by the

Sacramento County Planning and Community

Development Department

Staff: Stuart Wilson, Richard H. Kallett

The Federal Energy Administration and the Department of Housing and Urban Development through Section 701 of the Housing Act of 1954, as amended, provided partial financial support for this project, through the FEA-State of California Cooperative Agreement. Funding was administered through the Governor's Office of Planning and Research and the Sacramento Regional Area Planning Commission.

RESOLUTION NO. 79-215

ADOPTING THE ENERGY ELEMENT OF THE
SACRAMENTO COUNTY GENERAL PLAN

WHEREAS, an adequate supply of energy is vital to Sacramento County's growing economy and livelihood, while wasted energy is detrimental; and

WHEREAS, the availability of energy in the future is questionable, and conservation of energy and development of renewable energy resources are significant elements in a comprehensive program extending the availability of finite energy resources; and

WHEREAS, the Board of Supervisors of Sacramento County has previously stated its intent to support and promote energy conservation by adopting resolutions establishing a Sacramento County Energy Planning and Conservation Council, neighborhood planning standards, residential passive solar orientation policies, and a policy promoting the utilization of energy conservation measures and devices in all new construction; and

WHEREAS, the Board of Supervisors representing the people of Sacramento County in their local government, is in a unique and opportune position to take a leadership role in energy conservation locally by initiating and coordinating innovative and effective energy conservation programs; and

WHEREAS, the Sacramento Municipal Utility District has endorsed, in principle, the recommendations contained within the Energy Element and has declared its intent to work toward implementation of those recommendations within the District's authority;

NOW, THEREFORE, BE IT RESOLVED AND ORDERED that the Board of Supervisors of Sacramento County hereby adopts the attached Energy Element Policy Plan as an element of the Sacramento County General Plan; and

BE IT FURTHER RESOLVED THAT Sacramento County government agencies support the Energy Element of the Sacramento County General Plan.

BE IT FURTHER RESOLVED THAT the Sacramento County Energy Conservation and Planning Council and the Policy Planning Commission be commended for their time, effort, and dedication toward achieving a comprehensive energy conservation plan for Sacramento County; and

BE IT FURTHER RESOLVED THAT the Board of Supervisors of Sacramento County hereby requests the support and cooperation of all governmental agencies, private industrial, utility, and commercial firms; and the general public toward implementation of this Energy Element.

On a motion by Supervisor Collin, seconded by Supervisor Johnson, the foregoing resolution was passed and adopted by the Board of Supervisors of the County of Sacramento, State of California, this 15th day of February, 1979, by the following vote, to wit:

AYES: Supervisors, Collin, Johnson, Sheedy, Smoley

NOES: Supervisors, None

ABSENT: Supervisors, Wade

Sandra P. Smoley
Chairman
Board of Supervisors

(SEAL)

Attest: Betty T. Yee
Clerk of the Board of Supervisors

In accordance with Section 25103 of the Government Code of the State of California, a copy of this document has been delivered to the Chairman of the Board of Supervisors, County of Sacramento, and

FEB 15 1979

By Edna Zamil
Deputy Clerk, Board of Supervisors

FILED

FEB 15 1979

BOARD OF SUPERVISORS

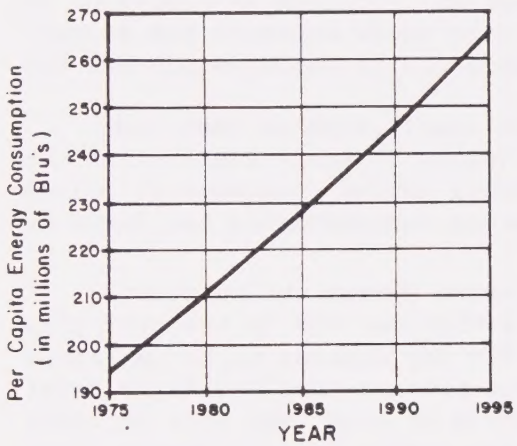
By Betty T. Yee
CLERK OF THE BOARD

THE ENERGY PROBLEM

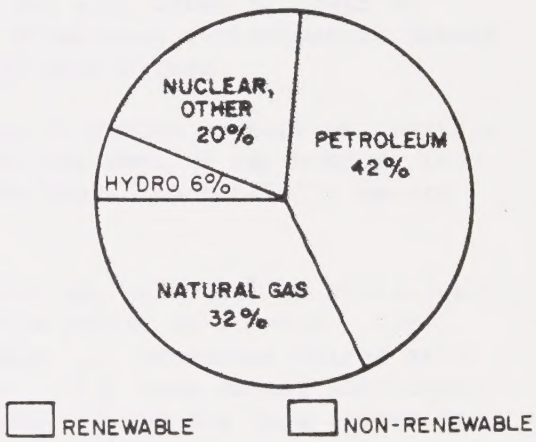
Based on past trends, annual per capita consumption of energy in Sacramento County is projected to increase from 195 million Btu's (British thermal units) in 1975 to 266 million Btu's by 1995. This increase, combined with projected population growth, would result in an 85 percent increase in total energy consumption in the county, from 134 trillion Btu's in 1975 to approximately 248 trillion Btu's in 1995.

At present, Sacramento County is heavily dependent on non-renewable energy sources, with only six percent of total energy coming from renewable sources (hydroelectricity). In fact, 74 percent of our energy comes from natural gas and petroleum, two sources which may be in critically short supply and experience very steep price increases within 20 years.

SACRAMENTO COUNTY PROJECTED
PER CAPITA ENERGY CONSUMPTION, 1975 - 1995



SACRAMENTO COUNTY
SOURCES OF ENERGY, 1975



In a time of increasing energy prices, such growth in energy consumption and dependency on non-renewable energy sources could place a severe strain on the economy of Sacramento County. Steps taken now towards solving this problem can be easier and more moderate than if we choose instead to wait until the last moment -- our options and our opportunities would then be diminished and the "sacrifices" we would be forced to make would be much greater.

Energy has become an integral part of our economic system. Stated from an historical perspective, "[t]he United States [economy] matured in an era of abundant fuel and declining real energy prices. Energy was substituted

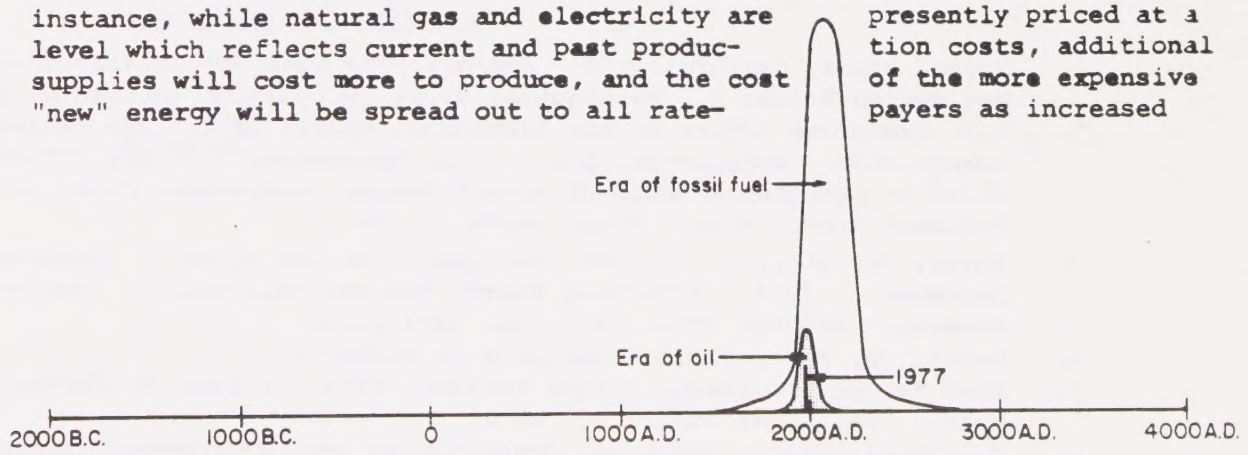
for all other factors of production -- including, wherever possible, human activity."[1] "As a result of the availability of cheap energy, the U.S. developed a stock of capital goods -- such as homes, cars, and factory equipment -- that uses energy inefficiently."[2] The extent to which cheap, abundant fuel has led to wastefulness is exemplified by these two facts: the U.S. uses two to three times as much energy per capita as such modern industrialized countries of Western Europe as Sweden, West Germany, and Switzerland, which enjoy standards of living comparable to our own;[3] and, "[i]n 1975, Americans *wasted* more fuel than was *used* by two-third's of the world's population."[4]

Our copious use of energy is not an economic or technological imperative, but rather a convenience, a luxury, which is the direct result of our abundant, easily accessible, and therefore cheap supply of fossil fuels. But "the United States has," in the words of one major study, "...entered a new age of energy...[in which]...we can no longer expect to get it with so little trouble and expense as we did in the recent past."[5]

There has been considerable debate as to the cause of the "Energy Crisis," however that term may be defined. Nonetheless, there is one thing certain about our energy future: energy will become increasingly expensive. While this increasing cost may not be the direct result of absolute scarcity, it will result from the fact that the remaining supplies of fossil fuels will be increasingly difficult to locate and mine and will often be found in fragile environments where both the costs of minimizing environmental damage and the consequences of its occurrence will be much higher.

What must be done, then, is to find a way to reduce as much as possible our extravagant waste of energy and to convert the base of our economy from finite to renewable energy sources in order to avoid potentially severe economic and environmental consequences.

Economically, energy conservation measures are justified by their cost-effectiveness to the individual user and to the public as a whole. For instance, while natural gas and electricity are presently priced at a level which reflects current and past production costs, additional supplies will cost more to produce, and the cost of the more expensive "new" energy will be spread out to all ratepayers as increased



"HUBBERT'S PIMPLE", THE WORK OF PETROLEUM GEOLOGIST M. KING HUBBERT, ILLUSTRATING HOW TRANSIENT THE ERA OF FOSSIL FUEL IS ON THE SCALE OF HUMAN HISTORY.
SOURCE: *Fortune, October 1977, pp. 246-247*

rates. There is also a question of whether enough capital will be available to finance as much new production capacity as continuation of past energy consumption trends would require, and, if this capital can be raised, what effect this might have on the cost and availability of investment capital in other sectors of the economy.[6] In contrast, "[s]maller-scale investments in [energy] conservation...allow for easier market entry and more competition within the private sector..."[7] thereby increasing employment opportunities and reducing prices. There are also social equity reasons for conserving energy. "Increasing costs of energy have unequal impacts on different groups in the population. For low-income households, direct energy costs tend to be a higher portion of their budgets. This burden will increase over time if electricity, gas, and petroleum prices increase faster than the general growth in income and prices."[8]

Dependence on fossil fuel imports, the dangers of which were dramatically illustrated by the 1973 Arab oil embargo, is one reason for turning from depletable sources of energy to renewable sources. Another is the significant dangers to environmental quality and human health and safety presented by "conventional technologies for the large-scale production and distribution of electricity and other forms of energy."[9] Finally, there is the concern of resource depletion: how soon certain resources will run out, whether other technologies and sources of energy can be developed in time to replace them, and whether energy options will be left to future generations.

In sum, there are numerous economic, social, environmental, and political reasons for making more efficient use of the energy we have and for developing renewable sources to replace our dwindling supplies of fossil fuels. In fact, it is possible in every area of human activity, "with the technology now available, to obtain at least the same level of benefits from products and services with [a] lower investment of energy."[10]

FOOTNOTES

1. Hayes, Denis, January, 1976. Energy: The Case for Conservation. Worldwatch Papaer 4. Washington, D.C.: Worldwatch Institute, p. 7.
2. U.S. Executive Office of the President, April, 1977. The National Energy Plan. Washington, D.C.: U.S. Government Printing Office. *Cited in* Sacramento Regional Area Planning Commission, June, 1977. Regional Energy Plan. Final Draft, p. 88.
3. Hayes, *op. cit.*, p. 14; *and* Schipper, Lee and Allan J. Lichtenberg, December 3, 1976. Efficient Energy Use and Well-Being: The Swedish Example. *Science* (Vol. 194), pp. 1001-1013.
4. Hayes, *op. cit.*, p. 14. Emphasis is author's.
5. Ford Foundation Energy Policy Project, 1974. *A Time to Choose*. Cambridge, Mass.: Ballinger Publ. Co., p. 1.
6. California Energy Resources Conservation and Development Commission, 1977. *California Energy Trends and Choices*, 1977 Biennial Report. Vol. 3: Opportunities for Energy Conservation, pp. 24-25.
7. *Ibid*, p. 27.
8. *Ibid*, p. 25.
9. *Ibid*, pp. 25-26
10. *Ibid*, p. 17.

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INTRODUCTION

The Energy Element is a component--or element--of the Sacramento County General Plan. The General Plan in turn is the official statement of the Board of Supervisors setting forth policies that will guide the physical growth of Sacramento County. As a policy document, it is a commitment to a course of action that will lead over time toward the kind of physical environment desired by the people who work and live in Sacramento County. One purpose of the Energy Element is to guide the update of the General Plan, presently getting under way, such that energy conservation is considered in the policy-making which guides the physical growth of Sacramento County.

The preparation of the Energy Element was conceived by the Sacramento County Energy Planning and Conservation Council in the Spring of 1976. The Energy Council is a group of citizens appointed by the Board of Supervisors to advise the Board on matters relating to energy. The Energy Council secured a grant from the Federal Energy Administration to help finance preparation of the Energy Element, and has guided its preparation.

The Energy Element consists of three major works -- a Research Report, a Policy Plan, and an Action Program. The Research Report provides background data for the Policy Plan. A county-wide "energy account" in the Research Report is intended to be updated annually, and will serve as a base by which to measure the effectiveness of the Energy Element.

The Policy Plan contains a goal statement, objectives, strategies, and policies. A goal is defined by the General Plan as describing the kind of environment considered to be ultimately desirable, the objective being somewhat more specific by pointing to a definite, achievable target. A strategy means a plan or method for achieving a goal. Under strategies are policy statements which are specific commitments to action. The Policy Plan, then, is the heart of the Energy Element; it is the official statement of the Board of Supervisors committing them to a defined course of action.

The Action Program, the third document of the Energy Element, details how the policies in the Policy Plan are to be implemented. It indicates which individual or agency is to be responsible for implementation and gives a target date for completion. It is intended that each policy will be adopted with at least one plan of action detailing implementation of that policy.

GOAL STATEMENT

IT IS THE GOAL OF SACRAMENTO COUNTY TO -

- REVERSE THE HISTORICAL TREND OF INCREASING PER CAPITA CONSUMPTION OF ENERGY, AND

- SHIFT TOWARD USING A GREATER SHARE OF RENEWABLE SOURCES OF ENERGY, AND

- SHIFT SEASONAL AND DAILY PEAK ENERGY DEMANDS TO INCREASE THE LOAD FACTOR OF ELECTRICAL GENERATING FACILITIES, WHILE

- MAINTAINING OR ENHANCING THE GENERAL STANDARD OF LIVING, THE LEVEL OF EMPLOYMENT, AND THE QUALITY OF THE ENVIRONMENT.

OBJECTIVES

Predictions of future per capita energy consumption, sources of fuel--particularly those that are non-renewable--extent of fuel availability, and electrical generating system load factor are difficult to make. Projections illustrated in the objectives below are therefore general expression of past trends; targets under each objective represents general aims. Adjustments reflecting new data can be made as the Energy Element is periodically updated.

I. REDUCE PER CAPITA CONSUMPTION OF ENERGY TO THE FOLLOWING TARGETS (SEE FIGURES 1 AND 2):

(The annual compounded growth rate of per capita energy consumption in California was 1.56% during the period of 1968-1973. The per capita consumption of energy in Sacramento County in 1975 was 195 million Btu's. Based on linear extrapolation of the 1968-1973 statewide growth rate, per capita consumption of energy in Sacramento County is projected to be 198 million Btu's in 1978 and 266 million Btu's in 1995, as illustrated in Figure 1.)

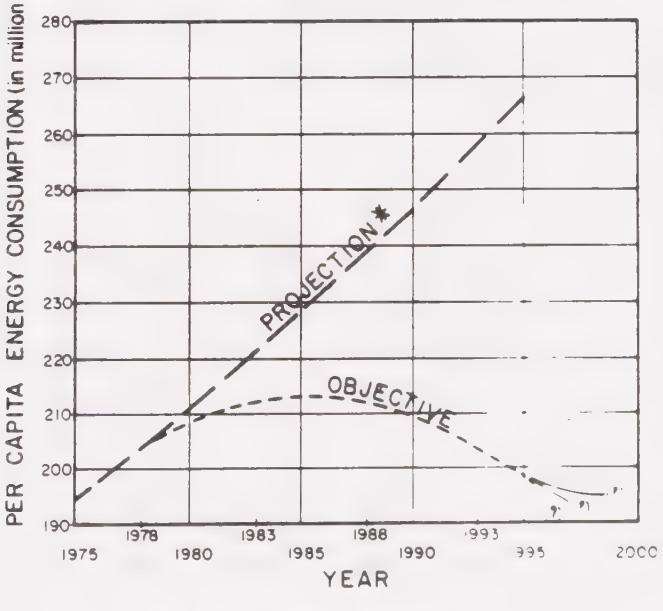
Short Range - Reduce the rate of growth of per capita energy use, such that by 1983 per capita consumption is no greater than 212 million Btu's per year.

Medium Range - Further reduce and then reverse the rate of growth, such that per capita use in 1988 is no greater than 212 million Btu's per year.

Long Range - Continue to decrease per capita energy use, such that by 1995 per capita consumption is no greater than 198 million Btu's per year.

FIGURE 1

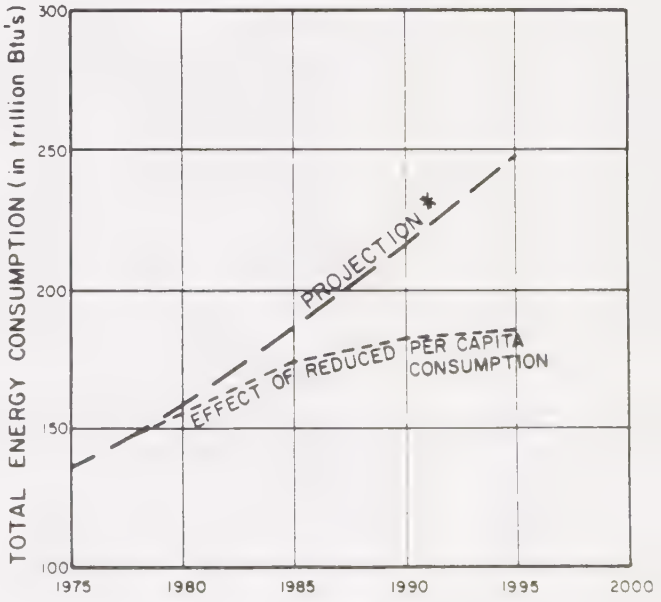
SACRAMENTO COUNTY PROJECTED PER CAPITA ENERGY CONSUMPTION, 1975-1995



* AT AN AVERAGE ANNUAL COMPOUND RATE OF 1.56%

FIGURE 2

SACRAMENTO COUNTY PROJECTED TOTAL ENERGY CONSUMPTION, 1975-1995



* CALCULATED USING PER CAPITA GROWTH RATE PROJECTION FROM FIG. 1 AND CALIFORNIA DEPT OF FINANCE POPULATION PROJECTIONS, IN 5-YEAR INCREMENTS

II. Reduce the Reliance on Non-Renewable Energy Sources, with Emphasis on Those in Shortest Supply, to the Following Targets (see Figure 3):

(In 1975, non-renewable sources of energy comprised 94% of total energy consumed in Sacramento County, and renewable sources comprised 6% of the total.)

Short Range - By 1983, reduce the non-renewable share of total energy sources to 90% by reducing the share of natural gas to 28% of total energy sources and the share of petroleum to 40% of total energy sources.

Medium Range By 1988, further reduce the non-renewable share of total energy sources to 86% by reducing the share of natural gas to 22% of the total and the share of petroleum to 37% of the total.

Long Range By 1995, further reduce the non-renewable share of total energy sources to 80% by reducing the share of natural gas to 16% of the total and the share of petroleum to 32% of the total.

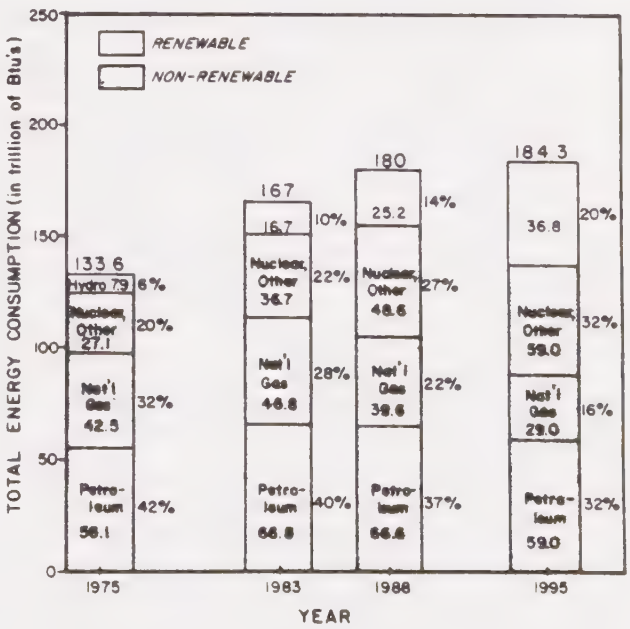
NOTE: *Predictions of future fuel sources, particularly those that are non-renewable, are difficult to make. These targets therefore represent general aims. Adjustments reflecting new data can be made as the Energy Element is periodically updated.*

FIGURE 3

PROPORTION OF RENEWABLE TO NON-RENEWABLE ENERGY SOURCES, BY SOURCE, ASSUMING ACHIEVEMENT OF CONSERVATION (OBJECTIVE I).

(NOTE: The height of each column represents total energy consumption in the designated year, assuming that Objective I is achieved, i.e., it reflects the lower curve in Figure 2 on the previous page.)

(NOTE: Figure 3 shows that, even with conservation measures and a large increase of renewable resources from 1975 - 1995, a deficiency of energy supplies will still occur. This figure shows meeting this deficiency by nuclear or other; however increased reliance on nuclear is neither intended nor implied.)



III. REDUCE SEASONAL AND DAILY PEAK ELECTRICAL ENERGY DEMAND, AND DISTRIBUTE FUTURE GROWTH IN ELECTRICAL ENERGY CONSUMPTION THROUGHOUT THE DAY AND YEAR, THEREBY INCREASING THE ANNUAL SYSTEM LOAD FACTOR, ACCORDING TO THE FOLLOWING TARGETS (SEE FIGURES 4 AND 5):

(SMUD system peak load was 342 megawatts in 1960 and 1,272 mw in 1975. The State Energy Commission projects this to increase to 2,400 mw by 1995. The system load factor in 1960 was 52.4% and in 1975 was 42.0%.)

Short Range - Reduce the rate of growth in peak demand of electrical energy, such that by 1983 peak demand is no greater than 1,641 megawatts, and increase the annual system load factor to no less than 44%.

Medium Range - Further reduce the rate of growth in peak demand, such that by 1988 peak demand is no greater than 1,778 megawatts, and further increase the annual system load factor to no less than 50%.

Long Range - Further reduce the rate of growth in peak demand, such that by 1995 peak demand is no greater than 1,781 megawatts and increases no further, and further increase the annual system load factor to no less than 65%.

FIGURE 4

SMUD SYSTEM PEAK LOAD, HISTORICAL AND PROJECTED, 1960-1995

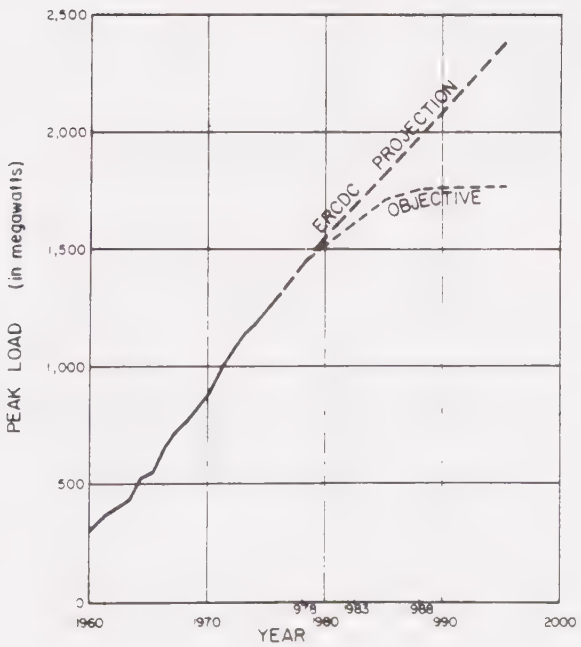
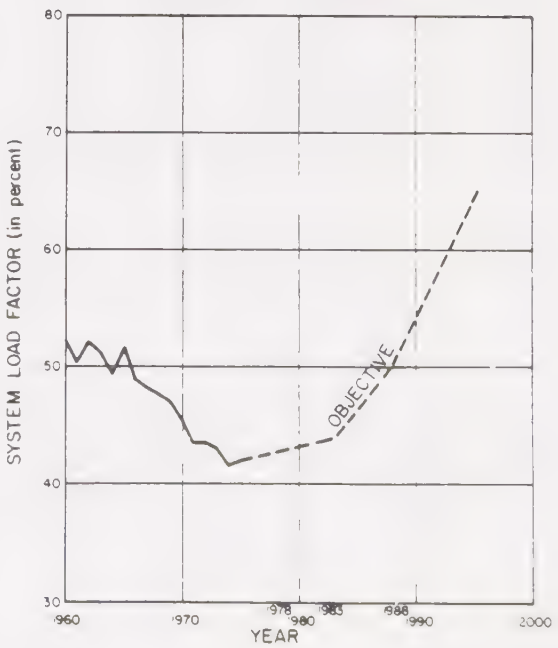


FIGURE 5

SMUD SYSTEM LOAD FACTOR, HISTORICAL AND PROJECTED, 1960-1995



STRATEGIES AND POLICIES

I. REDUCE CONSUMPTION - PER CAPITA ENERGY CONSUMPTION WILL BE REDUCED BY MINIMIZING WASTE AND UNNECESSARY USE, EMPHASIZING THE RESIDENTIAL AND TRANSPORTATION SECTORS WHICH TOGETHER COMPRISE NEARLY THREE-FOURTHS OF TOTAL ENERGY CONSUMPTION IN SACRAMENTO COUNTY.

Policies for the Residential Sector:

To reduce per capita consumption of energy in the residential sector, it is the policy of Sacramento County to -

1. *Adopt and implement energy efficient building standards for residential construction.*
2. *Agressively pursue programs to retrofit existing residences with ceiling insulation, such that 75% of currently uninsulated and underinsulated dwellings are insulated to at least an R-19 standard by 1988.*
3. *Increase the percentage of the housing stock with common wall dwellings by eliminating any impediments to the market supply and further provide appropriate incentives for their construction.*
4. *Develop and implement Neighborhood Planning Standards which would reduce the energy required to maintain interior spaces in the comfort zone, including such standards as tree planting and proper orientation of dwellings.*
5. *Inform the public of the need and of ways to conserve energy in the home.*

6. *Encourage the conservation and rehabilitation of existing housing and the revitalization of older, more intensively developed neighborhoods in the urban area.*

7. *Encourage consumers to purchase or rent energy efficient houses and apartments.*

Policies for the Transportation Sector:

To reduce the per capita energy consumption in the transportation sector, it is the policy of Sacramento County to -

8. *Reduce travel distances and reliance on the automobile and facilitate increased use of public transit through appropriate land use plans and regulations.*

9. *Actively support the efforts of the Regional Transit District to expand and upgrade service and attract an increasing percentage of travel.*

10. *Expand existing programs and develop new programs which promote and encourage vanpooling and carpooling.*

11. *Promote and encourage increased percentages of more efficient cars.*

12. *Inform the public of the need to reduce auto travel and encourage the use of public transit and other energy efficient modes of travel.*

13. *Continue implementation of the Bikeways Master Plan, and develop standards for neighborhood bikeways and pedestrian-ways, incorporating them into Neighborhood Planning Standards.*

Policies for Other Sectors:

To reduce the per capita energy consumption in the other sectors, it is the policy of Sacramento County to -

14. *Promote the location within the Sacramento area of those industries which are labor intensive, utilize solar energy systems, and are consistent with other policies in terms of environmental protection.*

15. *Encourage industry located or locating in the Sacramento area to participate in co-generation of power.*

16. *Aggressively pursue programs to retrofit with insulation those existing uninsulated or underinsulated commercial, institutional, and industrial buildings where economically justified.*

17. *Develop or revise design standards relating to building solar orientation, landscaping, impervisous surfaces, and parking space requirements to conserve energy.*

18. *Inform the agricultural industry of ways to conserve energy through the Cooperative Agricultural Extension office.*

II. SHIFT SOURCE - ENERGY SOURCES WILL BE SHIFTED INCREASINGLY TO RENEWABLE FORMS BY EXPANDING THE USE OF SOLAR WATER AND SPACE HEATING AND SPACE COOLING, INCREASING THE EFFICIENCY OF PRESENT HYDROELECTRIC GENERATORS, AND CAPTURING THE MAXIMUM AMOUNT OF ENERGY FROM WIND, FALLING WATER, AND GEOTHERMAL SOURCES, CONSISTENT WITH ENVIRONMENTAL PROTECTION.

To increase the contribution of solar water and space heating and space cooling, it is the policy of Sacramento County to -

19. *Promote the use of passive and active solar systems in new and existing residential, commercial, and institutional buildings as well as the installation of solar swimming pool heaters and solar water and space heating systems.*
20. *Support the development and improvement of solar space cooling systems.*
21. *Develop and implement standards for the protection of the solar rights of property owners.*

To increase the amount of energy from wind, falling water, and geothermal sources, it is the policy of Sacramento County to -

22. *Support the development and use of renewable sources of energy, including but not limited to biomass, solar, wind, and geothermal.*
23. *Advocate that the state legislate a tax incentive or other means of encouraging utilities to improve the efficiency of existing hydroelectric generators.*

III. REDUCE PEAK LOADS - PEAK LOADS WILL BE REDUCED BY PROVIDING ECONOMIC INCENTIVES AND SEEKING PUBLIC COOPERATION THROUGH INCREASED AWARENESS OF OVERALL CONSUMER SAVINGS AND PUBLIC BENEFITS.

To reduce peak loads and increase the annual system load factor, it is the policy of Sacramento County to -

24. *Investigate the effectiveness of reducing summer daily peak load by shifting working hours, particularly for office workers and, if effective, promote its implementation.*
25. *Inform the public of ways to reduce electrical consumption at times of peak load and of the resulting benefits.*
26. *Investigate in a joint effort with SMUD the feasibility and effectiveness of peak day pricing by rate structure and/or surcharge.*
27. *Support electronic load management as a method of reducing peak electrical load.*

IV. EXERCISE LEADERSHIP - COUNTY GOVERNMENT WILL BECOME THE LEAD AGENCY IN ENERGY PLANNING AND CONSERVATION BY SETTING AN EXAMPLE FOR OTHER AGENCIES AND INSTITUTIONS AND THE GENERAL PUBLIC THROUGH THE ENERGY EFFICIENT OPERATION OF COUNTY SERVICES AND FACILITIES; BY COORDINATING ENERGY CONSERVATION ACTIVITIES THROUGHOUT THE COUNTY; BY ACTIVELY ENCOURAGING FEDERAL, STATE, AND OTHER LOCAL GOVERNMENTS TO IMPLEMENT MEASURES IN SUPPORT OF THE COUNTY'S ENERGY GOAL AND OBJECTIVES; AND BY RAISING THE LEVEL OF PUBLIC AWARENESS OF THE ENERGY PROBLEM AND THE COUNTY'S ENERGY PROGRAM THROUGH PUBLIC EDUCATION.

To exercise leadership in energy conservation, it is the policy of Sacramento County to -

28. *Institute total energy management (TEM) for county buildings.*
29. *Use life-cycle costing and, where applicable, consider energy efficiency ratios for county equipment purchases, including vehicles, and require that vendors on county property do likewise.*
30. *Recycle office waste paper.*
31. *Commit itself to the principles of source reduction and resource recovery of municipal solid waste.*
32. *Establish within a single office of county government responsibility for the following:*
    a. *coordinating energy conservation efforts in county government;*
    b. *publicizing the energy conservation programs of the city, county, SMUD, PG&E, and the state;*
    c. *providing staff support to the Energy Planning and Conservation Council;*

d. advocating, in cooperation with the county's legislative advocate, other government agencies to adopt programs which support the county's energy goal and objectives;

e. preparing an "energy account" annually of the previous year's demand and use of energy in Sacramento County; and

f. coordinating and encouraging appropriate federal, state, county, and other local governmental agencies to conserve energy in water treatment and wastewater treatment and reclamation.

33. Develop and implement standardized procedures for evaluating the initial and long-range energy impacts of proposed developments.

34. Design new county buildings to incorporate passive and active solar energy systems and total energy management.

35. Develop and implement a countywide water resources management plan which is based on conservation of energy and water resources.

36. Promote district heating for commercial, institutional, and high density residential buildings in downtown Sacramento.

GLOSSARY*

British thermal unit (Btu) - A unit of heat equal to approximately 252 calories. Also, the quantity of heat required to raise the temperature of one pound of water at its maximum density one degree Fahrenheit.

efficiency - The ratio of output to input of energy or power. For a process involving heat, efficiency is related to the initial and final temperature of the system.

energy efficiency ratio - The ratio of the cooling capacity of an air conditioner, in Btu's per hour, to the total electrical input, in watts, under specified test conditions established by the California State Energy Commission.

kilowatt - The unit of power equal to one thousand watts.

kilowatt-hour - A unit of electrical energy equivalent to 3,413 Btu's of heat energy expended per hour (some sources give ranges of 3,410 Btu's).

life-cycle costing - The calculation of the cost of a product over its expected "lifetime," i.e., the initial cost of maintenance and repairs, the cost of operating--including energy requirements--during its "lifetime," and the cost of disposal.

load management - The concept of influencing the amount of energy used by utility customers at a given time. Includes techniques to change the demand for energy at peak hours and physical devices that cycle equipment off and on.

megawatt - The unit of power equal to one million watts.

modal split - In transportation planning, the ridership of one mode (bus, car, train, bicycle, etc.) versus another mode. Expressed as a ratio or percentage, and usually referring to automobiles versus public transit.

peak energy demand - A given moment when demand for energy is significantly higher than for most other times. Often refers to a period of time, such as a certain part of the day or a certain season.

power - The rate at which work is done. The rate at which energy is used.

renewable resources - Self-perpetuating types of resources; living or biotic resources. Also, resources that are in finite quantity but can be used over, such as air and water.

system load factor - Generally described as the ratio of total sales of an electric utility system to its total generating capacity. One hundred percent system load factor would be selling all electricity for which the system has generating capacity.

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*SOURCE: Sacramento Regional Area Planning Commission, June 1977. Regional Energy Plan. Final Draft, pp. 120-129.

therm - A unit of energy measurement for natural gas, equivalent to 100,000 Btu's.

total energy management (TEM) - An energy conservation approach based on the premise that, to affect energy savings in a building or system, all of the components of that building or system must be made as efficient as possible, with each consuming the smallest amount of energy to perform the functions required.

vehicle miles travelled (VMT) - The number of miles travelled by a given group of motor vehicles during a given period of time. It is a measure of the amount of driving and can be used to calculate the consumption of petroleum fuels used in transportation.

watt - The amount of work available from an electric current of one ampere at a potential of one volt. The watt is also the metric unit of power, and is equal to a rate of energy consumption of one joule per second. One joule is roughly one thousandth of a British thermal unit.

The United States is at a turning point. It can choose, through piecemeal programs and policies, to continue the current state of drift. That course would require no hard decisions, no immediate sacrifices, and no adjustment to the new energy realities. That course may, for the moment, seem attractive. But, with each passing day, the United States falls farther behind in solving its energy problems. Consequently, its economic and foreign policy position weakens, its options dwindle, and the ultimate transition...becomes more difficult. If the United States faces up to the energy problem now... it will have the previous opportunity to make effective use of time and resources...

The energy crises presents a challenge to the American people. If they respond with understanding, maturity, imagination, and their traditional ingenuity, the challenge will be met. Even the "sacrifices" involved in conservation will have their immediate rewards in lower fuel bills and the sense of accomplishment that comes with achieving higher efficiency. By preparing now for the energy situation of the 1980's, the U.S. will not merely avoid a future time of adversity. It will ensure that the coming years will be among the most creative and constructive in American history.

- National Energy Plan, April, 1977. Released by the White House. Cited in SRAPC, Regional Energy Plan, Final Draft, June, 1977, p. 94.

SACRAMENTO COUNTY GENERAL PLAN

ENERGY ELEMENT

ACTION PROGRAM

Prepared by the

Sacramento County Planning and Community

Development Department

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INTRODUCTION

This Action Program is to accompany the Policy Plan of the Sacramento County General Plan Energy Element. The Action Program lists the proposed policies and then describes in one or more actions for each policy how each policy is to be implemented. It indicates which individual or agency is to be responsible for implementation and gives a target date for completion. It is the intent of the Action Program that each policy will be adopted with at least one plan of action for implementation of that policy. Where possible, an estimate of the approximate energy savings resulting from implementation of the policies and actions is presented, and the estimates and policies are summarized on the last page.

Additionally, a priority ranking is given for each action. These priorities are based on financial limitations imposed on the county. The priorities are given as P1, P2, and P3, and defined as follows:

PRIORITY ONE - Actions with no significant net county cost (should be implemented immediately).

PRIORITY TWO - Actions with significant consequences for energy conservtion and use but which may have significant net county costs (should be considered on the merits and compete with other programs for limited funds. Those which are not funded this year should be reconsidered prior to budget hearings of next year).

PRIORITY THREE - Items with significant net county cost and relatively modest consequences for energy conservation and use (actions should be deferred until May of next year).

LIST OF ABBREVIATIONS

Btu's	British thermal units
CalTrans	California Department of Transportation
Energy Council	Sacramento Energy Planning and Conservation Council
ERCDC	State Energy Resources Conservation and Development Commission, or State Energy Commission
PG&E	Pacific Gas & Electric Company
RT	Regional Transit
SMUD	Sacramento Municipal Utility District

REDUCE CONSUMPTION

1. ADOPT AND IMPLEMENT ENERGY EFFICIENT BUILDING STANDARDS FOR RESIDENTIAL CONSTRUCTION.

   1.1 ACTION: P1 The Board of Supervisors reaffirms its policy of promoting energy conservation by encouraging the utilization of energy conservation measures and devices in all new construction, regardless of the minimum building standards in effect at the time of construction. The Board of Supervisors shall direct the Energy Planning and Conservation Council to review this policy and evaluate its effectiveness by January 1, 1980.

   ENERGY EVALUATION: Cannot be quantified.

2. AGGRESSIVELY PURSUE PROGRAMS TO RETROFIT EXISTING RESIDENCES WITH CEILING INSULATION, SUCH THAT 75% OF CURRENTLY UNINSULATED AND UNDERINSULATED DWELLINGS ARE INSULATED TO AT LEAST AN R-19 STANDARD BY 1988.

   2.1 ACTION: P1 The county will provide direct financial assistance, to the extent of available CDBG funds, to low income neighborhoods for ceiling insulation, weather stripping, and other energy conservation home improvements, training and employing low income residents to do the work. The target is 3,000 single family and multiple family units per year. Either the Sacramento Housing and Redevelopment Agency or the County Administration and Finance Agency will administer the program and funding will come from the Community Development Block Grant program.

   2.2 ACTION: P1 The Board of Supervisors will by resolution encourage SMUD to continue and extend their insulation program through 1988 with an annual target of 11,000 single family and multiple family units per year. The Board Chairperson will transmit this resolution to the Chairperson of the SMUD Board of Directors.

   2.3 ACTION: The county will

   a) P1 support state legislation, by resolution of the Board of Supervisors, which would require that houses be insulated and/or be evaluated for energy efficiency at the time of sale of the house, and that the purchasers be notified of the results; or

   b) P3 develop an ordinance which requires the same as described in a), above.

   ENERGY EVALUATION: These actions would save an additional 187 billion Btu's each year that they are implemented. In 1983, the projected per capita consumption would be reduced by approximately 1.1 million Btu's, and by 1988, it would be reduced by approximately 2.2 million Btu's. In 1988, 1.34 billion cubic feet of natural gas and 136,000 megawatt-hours of initial electricity would be saved. A slight reduction in peak electrical demand would also result.

3. INCREASE THE PERCENTAGE OF THE HOUSING STOCK WITH COMMON WALL DWELLINGS BY ELIMINATING ANY IMPEDIMENTS TO THE MARKET SUPPLY AND FURTHER PROVIDE APPROPRIATE INCENTIVES FOR THEIR CONSTRUCTION.

3.1 ACTION: P3 In the update of the General Plan, the Planning Department will use market analysis data to insure that sufficient land area is available to meet the market demand for multiple-family housing in each of the urban communities.

3.2 ACTION: P3 The county will award density bonuses to those developments that meet the following general energy conservation criteria:

a) having increased numbers of dwellings with common walls, and

b) having proximity to specified employment centers or public transit routes. Guidelines for these criteria will be developed by the Planning Department and approved by the Policy Planning Commission within six months of adoption of the update of the General Plan.

ENERGY EVALUATION: The results of these actions will affect both the residential and transportation sector, but the effects on the latter sector is considered elsewhere under a different policy. It is estimated here that these actions would result in a savings of 1,830 billion Btu's in the residential sector in 1995, reducing the projected per capita consumption by 2.0 million Btu's. It should be noted that implementation of this policy will lessen the effects of Policy 1 above, since those effects were based on a higher single family to multi-family dwelling unit ratio. It is not clear how these actions would affect sources of energy. Peak demand of electricity would be reduced slightly.

4. DEVELOP AND IMPLEMENT NEIGHBORHOOD PLANNING STANDARDS WHICH WOULD REDUCE THE ENERGY REQUIRED TO MAINTAIN INTERIOR SPACES IN THE COMFORT ZONE, INCLUDING SUCH STANDARDS AS TREE PLANTING AND PROPER ORIENTATION OF DWELLINGS.

4.1 ACTION: P3 The Board of Supervisors by policy has adopted Neighborhood Planning Standards as described in this policy. In June of each year, the Energy Council will review the effects of the Neighborhood Planning Standards and recommend to the Board of Supervisors any changes for improvement.

ENERGY EVALUATION: This policy - particularly the dwelling orientation concept - would contribute significantly to energy conservation in the residential sector.

5. INFORM THE PUBLIC OF THE NEED AND WAYS TO CONSERVE ENERGY IN THE HOME.

5.1 ACTION: P3 The county office designated to coordinate energy activities in the county (see Policy 32, below) or the county representative providing staff support to the Energy Council will cooperate with the Energy Council, SMUD, PG&E, ERCDC, the Superintendent of Schools, the Los Rios Community College District, and the California State University and College system. The Energy Council will periodically review progress of such programs. Such programs will include, but not be limited to, the following which are to be considered by the Energy Council and staff: (a) landing a grant for a teacher training pilot program to add education of energy conservation in primary and secondary schools; (b) developing a syllabus for teaching a multi-media (TV, newspaper, etc.) class on energy conservation for the homeowner; and (c) expanding ERCDC's community college education program to train students for performing energy audits of homes.

ENERGY EVALUATION: The effects of these programs cannot be quantified independently; however, they would contribute to the success of other policies.

6. ENCOURAGE THE CONSERVATION AND REHABILITATION OF EXISTING HOUSING AND THE REVITALIZATION OF OLDER, MORE INTENSIVELY DEVELOPED NEIGHBORHOODS IN THE URBAN AREA.

6.1 ACTION: P1 The county will implement a Housing Element of the General Plan, some of whose policies and programs would achieve the intent of this policy. The Housing Element will target 200 houses and multifamily units per year for major rehabilitation under the supervision of the Sacramento Housing and Redevelopment Agency utilizing Community Development Block Grant and Section 312 funds.

ENERGY EVALUATION: The significant energy savings from this action would come from (a) keeping neighborhoods viable and attractive so that residents are not encouraged or forced to "flee" from what may become a decaying urban area to the newer suburbs further from employment centers; and (b) a conservation of natural resources.

7. ENCOURAGE CONSUMERS TO PURCHASE OR RENT ENERGY EFFICIENT HOUSES AND APARTMENTS.

7.1 ACTION: P3 The county will require by ordinance that, beginning January 1, 1980, prospective tenants of rental units (single and multi-family) will be informed by the landlords of the extent of ceiling insulation in the rental unit.

7.2 ACTION: P1 The Board of Supervisors will, by resolution, encourage SMUD to hire and train people to conduct energy audits of residences on request, and to publicize the service. Such a program may be fundable through the Comprehensive Employment Training Act (CETA).

ENERGY EVALUATION: Cannot be quantified.

8. REDUCE TRAVEL DISTANCES AND RELIANCE ON THE AUTOMOBILE AND FACILITATE INCREASED USE OF PUBLIC TRANSIT THROUGH APPROPRIATE LAND USE PLANS AND REGULATIONS.

8.1 ACTION: P2 The Planning Department will investigate the energy implications of the widespread dispersal, throughout urban residential areas, of those retail and service activities which require relatively small markets. The department will recommend to the Energy Council and Policy Planning Commission appropriate commercial land use policies and regulations toward meeting the objectives of the Energy Element.

8.2 ACTION: P2 The Planning Department will review the Zoning Code list of permitted or conditionally permitted "home occupations" with the objective of expanding the list to the maximum extent consistent with residential neighborhood preservation. If additional uses are found to be appropriate, an amendment to the Zoning Code will be drafted.

8.3 ACTION: P2 The Planning Department along with the Department of Public Works will identify the major employment centers in the county and conduct land use studies of these centers and surrounding areas. The studies will identify suitable sites for higher density housing and will examine the potential for mixed use developments. The Planning Department will also identify major employment centers which have the capacity for further concentration of employment and can be efficiently and flexibly served by public transit. This entire study will conclude with recommendations for amendments to the General Plan and to community plans implementing the intent of this policy.

8.4 ACTION: P3 The Planning Department will develop detailed design guidelines, relating to circulation, safety, appearance, etc., to accommodate higher density living.

8.5 ACTION: P1 The Policy Planning Commission will recommend and the Board of Supervisors will adopt clear and concise definitions of "leap-frog" development and "contiguous growth," and these will be adopted as part of the General Plan.

8.6 ACTION: P2 Planning Department will review the Central City Plan to determine if it will adequately compliment this policy, and make recommendations for changes if appropriate. The department staff will work with City Planning Commission staff to determine the appropriate and specific county role in implementing the Central City Plan. The department will recommend to the Board of Supervisors support of the Plan and adoption of specific actions to assist in implementing the Plan.

8.7 ACTION: P2 The Board of Supervisors will by resolution encourage the Sacramento City Council to adopt and implement this policy.

8.8 ACTION: P2 The Board of Supervisors will expedite acquisition and development of the American River Parkway and other regional recreation areas and facilities which are located in close proximity to the metropolitan Sacramento area, and provide adequate, safe, and convenient non-vehicular access to these areas.

ENERGY EVALUATION: The effects of these actions relating to the transportation sector are difficult to measure independently. An estimate can be made, however, combining the effects of these actions. This estimate is as follows: by 1995, implementation of these actions could result in a savings of 62 million gallons of fuel (gasoline and diesel) or 7,700 billion Btu's. Projected 1995 per capita consumption could be reduced by approximately 8.3 million Btu's.

9. ACTIVELY SUPPORT THE EFFORTS OF THE REGIONAL TRANSIT DISTRICT TO EXPAND AND UPGRADE SERVICE AND ATTRACT AN INCREASING PERCENTAGE OF TRAVEL.

9.1 ACTION: P2 Provide staff assistance in the cooperative effort of Regional Transit, the Sacramento Regional Area Planning Commission, and the California Department of Transportation in the development and implementation of the Regional Transit General Plan. The county will further support this effort through its own transportation study now in progress by coordinating its recommended alternative plans and policies with those of the RT General Plan, such that both the General Plan and the transportation study are mutually supportive.

9.2 ACTION: P2 The Board of Supervisors will by resolution request that RT extend transit service to major regional parks during peak use weekends and holidays to 1) reduce the reliance on the automobile and 2) enhance the opportunities for low income residents to use and enjoy public park areas.

9.3 ACTION: P2 The Board of Supervisors will, by resolution, support the 1/4-cent sales tax election to provide a secure base of local revenue for the Regional Transit District.

9.4 ACTION: P2 The Board of Supervisors will continue to provide financial support for the Regional Transit District sufficient to maintain the present level of service provided all other means of maintaining service are also attempted, including fare increases and cost reductions where possible.

ENERGY EVALUATION: See Policy 8, above.

10. EXPAND EXISTING PROGRAMS AND DEVELOP NEW PROGRAMS WHICH PROMOTE AND ENCOURAGE VANPOOLING AND CARPOOLING.

10.1 ACTION: P1 The Planning Department and the Department of Public Works, during the upcoming transportation study, will investigate and develop or expand vanpooling and carpooling programs for county employees and for county residents, coordinating their efforts with the Department of General Services and the California Department of Transportation. Recommendations for program development will be forwarded to the Board of Supervisors within two years of adoption.

ENERGY EVALUATION: Under the current CalTrans ridesharing program, approximately 3,750 participants have saved about 94 billion Btu's per year. If the ridesharing program is increased so as to comprise the same proportion of the population in 1995, 4,650 participants would save 74 billion Btu's in that year (it is less than 1975 savings due to increases in auto fuel efficiency; if efficiency is assumed constant--for comparison purposes only--the 1995 fuel savings would be 118 billion Btu's). If the proportion of ridesharing participants as a part of the population is doubled by 1995 to 9,300 participants, the 1995 fuel savings would be 1,190,000 gallons or 148 billion Btu's per year (again, at a higher auto fuel efficiency). The per capita savings that year would be 0.16 million Btu's.

11. PROMOTE AND ENCOURAGE INCREASED PERCENTAGES OF MORE EFFICIENT CARS.

11.1 ACTION: The Planning Department will recommend amendments to the Zoning Code modifying parking space requirements which reflect greater numbers of compact and subcompact cars. The recommendations will be forwarded to the Project Planning Commission within one year of adoption of this policy.

ENERGY EVALUATION: Cannot be quantified.

12. INFORM THE PUBLIC OF THE NEED TO REDUCE AUTO TRAVEL AND ENCOURAGE THE USE OF PUBLIC TRANSIT AND OTHER ENERGY EFFICIENT MODES OF TRAVEL.

12.1 ACTION: P3 The county office designated to coordinate energy activities in the county (see Policy 32, below) or the county representative providing staff support to the Energy Council will cooperate in the development of education programs in conformance with this policy, and in cooperation with the Energy Council, ERCDC, CalTrans, the County Department of Public Works, and Regional Transit.

ENERGY EVALUATION: The effects of this action cannot be quantified independently; however, it would contribute to the success of other policies.

13. CONTINUE IMPLEMENTATION OF THE BIKEWAYS MASTER PLAN, AND DEVELOP STANDARDS FOR NEIGHBORHOOD BIKEWAYS AND PEDESTRIAN-WAYS, INCORPORATING THEM INTO NEIGHBORHOOD PLANNING STANDARDS.

13.1 ACTION: P3 The Departments of Planning, Parks and Recreation, and Public Works will develop and recommend standards and appropriate ordinances and amendments for neighborhood bikeways and pedestrian-ways within one year of adoption of this policy.

ENERGY EVALUATION: Cannot be quantified.

14. PROMOTE THE LOCATION WITHIN THE SACRAMENTO AREA OF THOSE INDUSTRIES WHICH ARE LABOR INTENSIVE, UTILIZE SOLAR ENERGY SYSTEMS, AND ARE CONSISTENT WITH OTHER COUNTY POLICIES IN TERMS OF ENVIRONMENTAL PROTECTION.

14.1 ACTION: P1 The Community Development and Environmental Protection Agency will conduct a study to determine a priority ranking of types of industry to attract to the Sacramento area, based on labor intensity, energy requirements, and environmental effects. Following this study, the agency will identify specific site locations in the county, suitable for each industry and consistent with policies in this Energy Element relating to land use and transportation. The county will then encourage the Sacramento Area Commerce and Trade Organization to pursue those industries ranking high on the priority list to locate in the Sacramento area.

ENERGY EVALUATION: While the addition of industry to the Sacramento area will increase the area's total energy consumption, industrial growth is already planned. The type of industry that locates in the area, however, can significantly effect the total energy consumption. While no quantitative estimate can be given since there are no projections for industrial growth, the following table is included to give an indication of the wide range of energy requirements by industry type.

(PLEASE SEE NEXT PAGE FOR TABLE)

TABLE 1
ENERGY USE OF ALTERNATIVE INDUSTRY TYPES

Industry Type	Million Btu's Used Per Job in 1975
Petroleum and Coal	15,132
Aluminum	7,100
Chemicals, Drugs, Paints & Allied Products	3,598
Paper and Allied Products	3,532
Iron and Steel	2,650
Stone, Clay and Glass Products	2,298
Nonferrous Metals (other than aluminum)	1,800
Construction	910
Lumber and Wood Products	630
Food and Kindred Products	576
Fabricated Metals	203
Machinery	136
Transportation Equipment	101
Printing and Publishing	90
Textiles and Apparel	11

SOURCE: Skidmore, Owings & Merrill and Portland Bureau of Planning, November, 1976. Energy and Land Use. Prepared for the Portland Energy Conservation Project as Working Paper No. 13, Comprehensive Plan for the City of Portland, Oregon. Page 11, Table 6.

15. ENCOURAGE INDUSTRY LOCATED OR LOCATING IN THE SACRAMENTO AREA TO PARTICIPATE IN CO-GENERATION OF POWER.

15.1 ACTION: P3 The Community Development and Environmental Protection Agency will request a joint study with ERCDC and SMUD to identify sites and industries in Sacramento County that have a potential for co-generation, and seek to develop a pilot project.

15.2 ACTION: P3 In the industrial site identification study described in the action of Policy 14, above, identification of potential co-generation sites, if compatible with each given industry, should be part of that study.

ENERGY EVALUATION: The effects of these actions cannot be quantified because the potential for co-generation in Sacramento County has not been identified. However, statewide, the ERCDC has estimated a significant potential for energy production and conservation by utilizing otherwise wasted energy.

16. AGGRESSIVELY PURSUE PROGRAMS TO RETROFIT WITH INSULATION THOSE EXISTING UNINSULATED OR UNDERINSULATED COMMERCIAL, INSTITUTIONAL, AND INDUSTRIAL BUILDINGS WHERE ECONOMICALLY JUSTIFIED.

16.1 ACTION: P1 The Board of Supervisors will by resolution encourage SMUD, PG&E, and the ERCDC to continue and expand their existing programs which encourage insulation retrofit of existing commercial, industrial, and institutional buildings.

16.2 ACTION: P3 Within 18 months following the adoption of this policy, the Department of General Services will review or have reviewed, with the assistance of SMUD, all county-owned buildings for feasibility of retrofitting them with insulation (see the third action under Policy 19, below). In determining economic feasibility, the life cycle costs will compare the initial cost with the increasing marginal cost of energy as projected.

ENERGY EVALUATION: Cannot be quantified at this time.

17. DEVELOP OR REVISE COMMERCIAL AND INDUSTRIAL DESIGN STANDARDS RELATING TO BUILDING SOLAR ORIENTATION, LANDSCAPING, IMPERVIOUS SURFACES, AND PARKING SPACE REQUIREMENTS TO CONSERVE ENERGY.

17.1 ACTION: P2 The Planning Department will recommend policies and/or amendments to the Zoning Code establishing standards for commercial and industrial building and/or lot orientation and modifying landscaping and parking requirements to achieve conservation of energy. Examples may include the use of landscaping for shading windows and parking areas, use of common parking areas for adjoining uses whose peak business hours occur at different times, and changing the peak parking demand as the basis for parking space requirements.

ENERGY EVALUATION: Cannot be quantified at this time.

18. INFORM THE AGRICULTURAL INDUSTRY OF WAYS TO CONSERVE ENERGY THROUGH THE COOPERATIVE AGRICULTURAL EXTENSION.

18.1 ACTION: P3 The Cooperative Agricultural Extension will develop an education program to inform the agricultural industry in the county of ways to conserve energy. The program will be developed in cooperation with other energy conservation educational programs to be developed under Policies 5 and 12 above, and Policy 25 below. A recommended program should be forwarded to the Board of Supervisors within six months of adoption of this policy.

ENERGY EVALUATION: Cannot be quantified at this time.

SHIFT SOURCE

19. PROMOTE THE USE OF PASSIVE AND ACTIVE SOLAR SYSTEMS IN NEW AND EXISTING RESIDENTIAL, COMMERCIAL, AND INSTITUTIONAL BUILDINGS AS WELL AS THE INSTALLATION OF SOLAR SWIMMING POOL HEATERS AND SOLAR WATER AND SPACE HEATING SYSTEMS.

19.1 ACTION: P1 In the design of all new county-owned buildings, the county will consider active solar devices for water heating, space heating, and/or space cooling on the basis of the following: 1) cost effectiveness, including life-cycle costing at the marginal cost of "new" energy production; 2) available state and federal government funding; and 3) anticipation of future retrofit of solar devices if not presently cost-effective.

19.2 ACTION: P2 The Board of Supervisors will by resolution encourage the Sacramento City Architectural Review Board to develop guidelines by which to evaluate the energy efficiency and the potential for passive and active solar energy systems of those residential and non-residential buildings reviewed by the Architectural Review Board.

19.3 ACTION: P2 Within 18 months following the adoption of this policy, the Department of General Services in cooperation with SMUD will review or have reviewed all county owned buildings for the economic and structural feasibility of retrofitting them with active solar heating equipment. The Department of General Services will prepare a retrofitting schedule for the Board of Supervisor's review and approval.

19.4 ACTION: P1 All future swimming pools operated by the county and dependent park districts, which are to be heated, will be equipped with solar heating units within practical limits as determined by life-cycle costing at marginal cost of "new" energy production.

19.5 ACTION: P3 The County Community Development and Environmental Protection Agency, in a joint effort with the City of Sacramento, SMUD, and PG&E, will investigate the feasibility of establishing a mechanism for leasing to the public solar energy equipment (pool heaters, domestic water heaters, space heaters, and/or space coolers). Findings of this study will be presented to the various decision-making bodies within eighteen months of adoption of this action. If shown feasible, a plan for implementation will be recommended within the following twelve months.

19.6 ACTION: P1 The Board of Supervisors will by resolution request that the State of California create a long term, low-interest loan program for local governments, small businesses, and consumers aimed at stimulating the production and consumption of solar energy in California.

ENERGY EVALUATION: The effects of these actions cannot be quantified at this time; however, they may be significant.

The following estimate of energy savings is presented as a point of information and for purposes of comparison:

Assume that a) for all new single family homes built on land subdivided beginning January 1, 1980, at least fifty percent of those homes constructed by each builder will have 80 percent of domestic water heating needs and 60 percent of space heating needs met by active solar equipment; b) all multiple family structures of four dwelling units or less including duplexes built beginning January 1, 1981 will have 80 percent of domestic water heating needs and 50 percent of space heating needs met by active solar equipment; and c) all multiple family structures of five units or more built beginning January 1, 1981, will have 80 percent of domestic water heating needs met by active solar equipment. If new residential units built up to 1995 are required to have solar equipment meeting the standards described in the assumption above, it can be expected that energy saved in the year 1995 could amount to roughly 3,700 billion Btu's or 9.4 million Btu's per capita. The other actions in this policy would have additional energy savings.

20. SUPPORT THE DEVELOPMENT AND IMPROVEMENT OF SOLAR SPACE COOLING SYSTEMS.

20.1 ACTION: P1 The Board of Supervisors will by resolution encourage the state and federal governments to accelerate the technical development and improvement and the widescale application of solar space cooling systems. The Board Chairperson will transmit this resolution to the local state legislators, congressmen, and senators.

ENERGY EVALUATION: Cannot be quantified at this time.

21. DEVELOP AND IMPLEMENT STANDARDS FOR THE PROTECTION OF SOLAR RIGHTS OF PROPERTY OWNERS.

21.1 ACTION: P2 The Neighborhood Planning Standards Policy adopted by the Board of Supervisors directs the Planning Department and County Counsel to keep abreast of new developments in the field of solar rights and report back to the Board when feasible options become available. The Environmental Law Institute has been conducting an investigation of solar rights to be implemented by local government. This action will direct that, upon completion of the ELI investigation, the Planning Department and County Counsel review its conclusions and recommendations and, considering local conditions, draft an ordinance and/or amendments to existing ordinances for the protection of solar rights.

ENERGY EVALUATION: This action will enhance the ability to implement the effects of other policies promoting the development of solar energy.

22. SUPPORT THE DEVELOPMENT AND USE OF RENEWABLE SOURCES OF ENERGY, INCLUDING BUT NOT LIMITED TO BIOMASS, SOLAR, WIND, AND GEOTHERMAL.

22.1 ACTION: P1 The Board of Supervisors will by resolution inform the State Legislature and the Congress that the County of Sacramento supports the development and use of renewable sources of energy, including biomass, solar, wind, and geothermal.

22.2 ACTION: P1 The Board of Supervisors will by resolution encourage SMUD to consider using renewable sources of energy for future electrical-generating facilities.

22.3 ACTION: P2 Request SMUD, in cooperation with U.C. Davis and the Cooperative Agricultural Extension Service, to initiate a joint study of the feasibility of generating electricity in Sacramento County using agricultural or lumber waste products. The study would cover supply of fuel, marketing of electricity, method of organization and control, and financing. The study and recommendations will be transmitted to the County Board of Supervisors and the SMUD Board of Directors within 18 months of adoption of this policy.

ENERGY EVALUATION: Cannot be quantified at this time.

23. ADVOCATE THAT THE STATE LEGISLATE A TAX INCENTIVE OR OTHER MEANS OF ENCOURAGING UTILITIES TO IMPROVE THE EFFICIENCY OF EXISTING HYDROELECTRIC GENERATORS.

23.1 ACTION: P1 The Board of Supervisors will implement this policy with a resolution to the State Legislature, drafted by the Energy Council and County Counsel within three months of adoption of this policy.

REDUCE PEAK LOADS

24. INVESTIGATE THE EFFECTIVENESS OF REDUCING SUMMER DAILY PEAK LOAD BY SHIFTING WORKING HOURS, PARTICULARLY FOR OFFICE WORKERS AND, IF EFFECTIVE, PROMOTE ITS IMPLEMENTATION.

24.1 ACTION: P3 The Department of General Services, with assistance from the ERCDC and SMUD, will conduct this investigation relating it to county workers in particular. The department will transmit its conclusions and recommendations to the Energy Council within one year of adoption of this policy.

ENERGY EVALUATION: To be determined in the above investigation.

25. INFORM THE PUBLIC OF WAYS TO REDUCE ELECTRICAL CONSUMPTION AT TIMES OF PEAK LOAD AND OF THE RESULTING BENEFITS.

25.1 ACTION: P3 The county office designated to coordinate energy activities in the county (see Policy 32, below) or the representative providing staff support to the Energy Council will cooperate in the development of education programs in conformance with this policy, and in cooperation with the Energy Council, ERCDC, and SMUD.

ENERGY EVALUATION: The effects of this action cannot be quantified independently, but would contribute to the success of other policies.

26. INVESTIGATE IN A JOINT EFFORT WITH SMUD THE FEASIBILITY AND EFFECTIVENESS OF PEAK DAY PRICING BY RATE STRUCTURE AND/OR SURCHARGE.

26.1 ACTION: P3 The Administration and Finance Agency will cooperate with SMUD to determine the feasibility and effectiveness of peak day pricing by SMUD on their rate structure and/or by the county levying a surcharge. The investigation will also seek assistance from the ERCDC. Conclusions and recommendations will be transmitted to the Energy Council, Board of Supervisors, and SMUD Board of Directors within two years of adoption of this policy.

ENERGY EVALUATION: Cannot be quantified at this time but, in terms of reducing peak demand, can be significant.

27. SUPPORT ELECTRONIC LOAD MANAGEMENT AS A METHOD OF REDUCING PEAK ELECTRICAL LOAD.

27.1 ACTION: P1 The Department of General Services will consult with SMUD to determine which county buildings can participate in electronic load management of space conditioning equipment by SMUD, and as each building is identified as suitable, the department and SMUD will take appropriate measures for those buildings to be involved.

ENERGY EVALUATION: Will be determined as above study progresses.

EXERCISE LEADERSHIP

28. INSTITUTE TOTAL ENERGY MANAGEMENT (TEM) FOR COUNTY BUILDINGS.

28.1 ACTION: P2 The Department of General Services has already partially implemented this policy and is continuing to do so. Under this policy, the department will continue, with the assistance of SMUD, and the ERCDC, to periodically evaluate and identify operation and

maintenance procedures and equipment which can be made more energy efficient. This will include extending the energy systems computerization of the new administration building to surrounding county buildings.

ENERGY EVALUATION: From Fiscal Year 1975-76 to FY 1976-77, the county saved 386,174 therms of natural gas and 2,629,577 kwh of electricity, most of which was attributed to energy conservation practices. These savings translate to 47.6 billion Btu's, or roughly 0.07 million Btu's per capita.

29. USE LIFE-CYCLE COSTING AND, WHERE APPLICABLE, CONSIDER ENERGY EFFICIENCY RATIOS FOR COUNTY EQUIPMENT PURCHASES, INCLUDING VEHICLES, AND REQUIRE THAT VENDORS ON COUNTY PROPERTY DO LIKEWISE.

29.1 ACTION: P1 Resolution No. 76-270 of the Board of Supervisors directs County Counsel to amend existing county ordinances concerning the purchase of equipment such that all new equipment costs will be evaluated not only on the basis of initial cost but also on the basis of energy specifications and anticipated operating costs over the useful life of the equipment.

29.2 ACTION: P3 The Department of General Services will work with County Counsel to revise procurement procedures, vendor contract policies and any ordinances as necessary to require vehicle purchases and equipment purchases by vendors located on county property be evaluated on a life-cycle costing basis.

ENERGY EVALUATION: Cannot be quantified.

30. RECYCLE OFFICE WASTE PAPER.

30.1 ACTION: P1 The Department of General Services has instituted a pilot program to recycle white office paper generated by downtown county workers.

This program will be expanded to cover the Department of Welfare offices and the Bradshaw complex. Under this action, the program will continue and will be expanded to include mixed office paper as soon as economically feasible.

30.2 ACTION: P1 The Department of General Services will set up a timetable by which the county will begin replacing its purchases of paper supplies with paper made of recycled paper as soon as economically feasible.

ENERGY EVALUATION: The Department of General Services expects to retrieve and sell roughly 200 tons of paper per year under the present program. Approximately 21 million Btu's are required to produce one ton of paper from virgin resources. However, no data is readily available to present the energy cost of producing paper from recycled fibers (other than newspapers). The energy savings, nonetheless, would be relatively small on a county-wide scale, but the leadership of the county in recycling and the stimulation of the recycled paper market and industry could be significant.

31. COMMIT ITSELF TO THE PRINCIPLES OF SOURCE REDUCTION AND RESOURCE RECOVERY OF MUNICIPAL SOLID WASTE.

31.1 ACTION: P2 The Department of Public Works will investigate the most practical and effective means for resource recovery by "home separation" for such resources as newspapers, bottles, cans, and others. Conclusions and a recommended implementation program will be transmitted to the Energy Council and the Board of Supervisors within one year of adoption of this policy.

31.2 ACTION: The county will

a) P1 support state legislation, by a resolution of the Board of Supervisors, which would regulate non-returnable beverage containers either through prohibition, tax, or deposit; and/or

b) P3 develop an ordinance within six months of adoption of this policy which would regulate by a deposit charge those non-returnable beverage containers sold within the county.

ENERGY EVALUATION: A full-scale curbside newspaper pickup program by the county and city could result in an energy savings of 83 billion Btu's in 1980, or 0.1 million Btu's per capita. A countywide returnable beverage container program could save as much as 975 billion Btu's in 1980, or 1.3 million Btu's per capita. It should be noted, however, that not all of the savings would accrue to Sacramento County since the energy costs and savings in manufacturing and transportation, for example, are often located outside of Sacramento County.

32. ESTABLISH WITHIN A SINGLE OFFICE OF COUNTY GOVERNMENT RESPONSIBILITY FOR THE FOLLOWING:

a) COORDINATING ENERGY CONSERVATION EFFORTS IN COUNTY GOVERNMENT;

b) PUBLICIZING THE ENERGY CONSERVATION PROGRAMS OF THE CITY, COUNTY, SMUD, PG&E, AND THE STATE;

c) PROVIDING STAFF SUPPORT TO THE ENERGY PLANNING AND CONSERVATION COUNCIL;

d) ADVOCATING, IN COOPERATION WITH THE COUNTY'S LEGISLATIVE ADVOCATE, OTHER GOVERNMENT AGENCIES TO ADOPT PROGRAMS WHICH SUPPORT THE COUNTY'S ENERGY GOAL AND OBJECTIVES;

e) PREPARING AN "ENERGY ACCOUNT" ANNUALLY OF THE PREVIOUS YEAR'S DEMAND AND USE OF ENERGY IN SACRAMENTO COUNTY; AND

f) COORDINATING AND ENCOURAGING APPROPRIATE FEDERAL, STATE, COUNTY, AND OTHER LOCAL GOVERNMENTAL AGENCIES TO CONSERVE ENERGY IN WATER TREATMENT AND WASTEWATER TREATMENT AND RECLAMATION.

32.1 ACTION: P1 The Board of Supervisors will initiate formation of an ad hoc committee to develop a grant proposal for funding the means to implement this policy and to more explicitly define the responsibilities. The committee should consist of a representative of the Board of Supervisors, SMUD Board of Directors, Sacramento City Council, SRAPC, Energy Council, and PG&E. Once the proposal is developed and transmitted to the Board of Supervisors for action, which should take no more than six months, the committee would be dissolved. Possible sources of funding include the federal departments of Energy and Housing and Urban Development and the State Energy Commission.

32.2 ACTION: P1 The Board of Supervisors will adopt a resolution urging SMUD to take a lead role in energy planning and conservation in the community with a request that SMUD assume some of the responsibilities outlined in the above policy, particularly public education, intergovernmental coordination, and preparation of an annual "energy account" for the County.

ENERGY EVALUATION: The effects of this action cannot be quantified independently, but would contribute to the success of other policies.

33. DEVELOP AND IMPLEMENT STANDARDIZED PROCEDURES FOR EVALUATING THE INITIAL AND LONG-RANGE ENERGY IMPACTS OF PROPOSED DEVELOPMENTS.

33.1 ACTION: P3 The State Energy Commission has been preparing such procedures for use in environmental review and supplementary CEQA requirements. As these procedures are completed, the Community Development and Environmental Protection Agency will review them and adopt those that are appropriate, incorporating them into the Sacramento County Guidelines for Implementing the California Environmental Quality Act.

ENERGY EVALUATION: Cannot be quantified. Incorporation of these procedures in the environmental review process will aid in identifying the areas of energy costs and savings of proposed developments and various alternatives.

34. DESIGN NEW COUNTY BUILDINGS TO INCORPORATE PASSIVE AND ACTIVE SOLAR ENERGY SYSTEMS AND TOTAL ENERGY MANAGEMENT.

34.1 ACTION: P1 See the first action under Policy 19 above.

ENERGY EVALUATION: Will be determined as each new facility is designed.

35. DEVELOP AND IMPLEMENT A COUNTYWIDE WATER RESOURCES MANAGEMENT PLAN WHICH IS BASED ON CONSERVATION OF ENERGY AND WATER RESOURCES.

35.1 ACTION: P3 The Department of Public Works has been preparing a countywide water management plan which is based on the concept of conjunctive use of groundwater and surface water supplies. The conjunctive use plan would be more energy conserving than no management of water supplies.

ENERGY EVALUATION: The energy savings resulting from implementation of the countywide water management plan would depend upon various alternatives. Two major alternatives, in terms of energy requirements, relate to the location of a water treatment plant serving the North Central Zone of the county. If the plant is located on the American River near Carmichael, implementation of the plan would result in an estimated annual savings of 341 billion Btu's in the year 2020 (data is not readily available to predict savings for 1995). If instead the plant is located at Folsom Dam, energy savings in 2020 would be approximately 444 billion Btu's. These savings would amount to under 0.4 million Btu's per capita and under 0.5 million Btu's per capita for the two respective alternatives.

36. PROMOTE DISTRICT HEATING FOR COMMERCIAL, INSTITUTIONAL, AND HIGH DENSITY RESIDENTIAL BUILDINGS IN DOWNTOWN SACRAMENTO.

36.1 ACTION: The County Department of General Services will request that ERCDC initiate a joint study with the State of California, City of Sacramento, SMUD, PG&E, and ERCDC to investigate the feasibility and potential of installing a district heating system for existing and future commercial, institutional, and high density residential buildings in downtown Sacramento. Study conclusions and recommendations will be forwarded to the appropriate decision-making bodies within one year of adoption of this policy.

ENERGY EVALUATION: Cannot be quantified at this time.

SUMMARY OF ENERGY SAVINGS

	Target Year	Total (billions of Btu's)	Per Capita (millions of Btu's)	Initial Electricity (MWH)	Natural Gas (millions of ft^3)	Gasoline, Diesel (millions of gallons)
1. Residential building standards						
2. Insulation retrofit, residential	1988	1,870	2.2	136,000	1,340	
3. Common wall dwellings	1995	1,830	2.0			
4. Neighborhood planning standards						
5. Inform public--residential		C				
6. Housing, neighborhood rehabilitation						
7. Purchase, rent energy efficient housing						
8. Transportation, land use	1995	7,700	8.3			62
9. Expand RT service		a				
10. Vanpooling, carpooling	1995	148	0.16			1.2
11. More efficient cars						
12. Inform public-transportation		C				
13. Bikeways, pedestrian-ways						
14. Labor-intensive industry						
15. Co-generation						
16. Insulation retrofit, non-residential						
17. Non-residential design standards						
18. Inform agricultural industry		C				
19. Solar heating	1995	3,700[b]	3.9[b]			
20. Solar cooling						
21. Solar rights		C				
22. Renewable sources of energy						
23. Hydroelectric generator efficiency						
24. Shifting working hours						
25. Inform public--peak load		C				
26. Peak day pricing						
27. Electronic load management						
28. Total energy management	c	48	0.07	2,630	37	
29. Life-cycle costing						
30. Recycle office waste paper						
31. Municipal solid waste	1980	1,058[d]	1.4[d]			
32. County Energy Office or Coordinator		C				
33. Energy evaluation of projects						
34. Design of new county buildings						
35. Water resources management plan	2020	444[e]	0.5[e]			

C - Contributes to the success of other policies. a - Included as part of preceding estimate. b - Not the result of the actions presented for this policy, but potential result under assumptions given in the Energy Evaluation for this policy, c - Savings in FY 1976-77 over FY 1975-76. d - Not all savings will accrue to Sacramento County. e - With water treatment plant located at Folsom Lake.